

AMENDMENT TO THE CLAIMS

WHAT IS CLAIMED IS:

1. (Currently Amended): A pressure sensor for measuring a pressure of a process fluid, comprising:

a vessel for receiving the process fluid;

an electrical insulator on an inner wall of the vessel;

an electrode integral with the ~~with an inner wall of the vessel~~ electrical insulator; and

a diaphragm that extends at least partially over the electrode and mates flush with the inner wall of the vessel and generally parallel with flow of process fluid through the vessel and that is configured to move relative to the electrode in response to the pressure of the process fluid;

wherein an electrical capacitance between the electrode and the diaphragm is related to a pressure of the process fluid.

2. (Currently Amended): The pressure sensor of claim 1 wherein the insulator and electrode extends partially around the inner wall of the vessel.

3. (Original): The pressure sensor of claim 2 wherein the diaphragm extends partially around the inner wall of the vessel.

4. (Original): The pressure sensor of claim 1 and further comprising:

a temperature sensor integral with the inner wall to measure a fluid temperature and to generate a temperature signal indicative of the fluid temperature.

5.(Original): The pressure sensor of claim 4 and further comprising:

processing electronics adapted to produce a pressure signal that is a function of the temperature signal.

6.(Currently Amended): The pressure sensor of claim 1 wherein the insulator and electrode extends completely around the inner wall of the vessel.

7.(Original): The pressure sensor of claim 6 wherein the diaphragm extends completely around the inner wall of the vessel.

8.(Currently Amended): The pressure sensor of claim 1 and further comprising:

a measurement circuit adapted to produce a pressure signal based on the electrical capacitance.

9.(Currently Amended): The pressure sensor of claim 1 and further comprising:

a wireless transceiver mounted to ~~the~~ a housing and electrically connected ~~with the annular capacitor for to the electrode to~~ wireless transmitting the pressure signal ~~to a control and/or monitoring system.~~

10.(Currently Amended): The pressure sensor of claim 1 wherein the electrode and the diaphragm form a first capacitor, and further comprising:

a flow restrictive element extending from the inner wall of the vessel into the process fluid; and  
a second capacitor having a second electrode integral with the inner wall and a second diaphragm that

extends at least partially over the second electrode and that is configured to move relative to the second electrode in response to the pressure of the process fluid.

~~wherein the flow restrictive element is positioned between the first capacitor and the second capacitor to measure a first capacitance and a second capacitance such that a difference between the first and the second capacitances is a differential capacitance representative of a differential pressure of the process fluid.~~

11.(Original): The pressure sensor of claim 1 wherein the diaphragm extends away from the inner wall into the process fluid.

12.(Currently Amended): The pressure sensor of claim 1 wherein the diaphragm is flush with the inner wall of the ~~fluid flow conduit~~ the vessel and the insulator and electrode ~~is~~ are recessed into the inner wall.

13.(Currently Amended): A differential pressure sensor for measuring a differential pressure of a process fluid in a conduit, comprising:

a flow restriction element integral with an inner wall of the conduit and adapted to produce a pressure drop when placed in-line with a fluid flow;

a first electrical insulator integral with an inner wall of the conduit;

a first capacitor having a first capacitance and including a first electrode integral with the first electrical insulator ~~inner wall of the conduit~~ and positioned upstream from the flow

restriction element and in-line with the process fluid; and  
a second electrical insulator integral with the inner wall of the conduit;  
a second capacitor having a second capacitance and including a second electrode integral with the second electrical insulator~~inner wall of the conduit~~ and positioned downstream from the flow restriction element and in-line with the process fluid;  
wherein ~~in a~~ the first capacitance and ~~a~~ the second capacitance are related to the differential pressure of the process fluid.

14.(Original): The differential pressure sensor of claim 13, further comprising:

processing electronics adapted to produce a flow rate signal that is indicative of a direction and a flow rate of the process fluid as a function of the first and the second capacitances.

15. (Currently Amended): The differential pressure sensor of claim 13, wherein the first capacitor ~~and the second capacitor~~ each comprises:

~~an electrode integral with an inner wall of the conduit; and~~  
a diaphragm that extends at least partially over the first electrode and that is configured to move relative to the first electrode in response to the pressure of the process fluid;  
wherein ~~an electrical~~ the first capacitance is between the first electrode and the diaphragm and is related to the pressure of the process fluid.

16.(Original): The differential pressure sensor of claim 13 wherein the flow restriction element has a narrow fluid flow passageway extending between symmetric first and second throat portions.

17.(Original): The differential pressure sensor of claim 13, further comprising:

a temperature sensor adapted to sense at least one of a temperature of the fluid flow and an operating temperature of the pressure sensor and to produce a temperature signal that is indicative of the sensed temperature.

18.(Currently Amended) The differential pressure sensor of claim 17 wherein ~~the~~a flow rate signal is ~~further~~ a function of the temperature signal.

19.(Original): The differential pressure sensor of claim 13 wherein each of the first capacitor and the second capacitor extend at least partially around the inner wall of the conduit.

20.(original): The differential pressure sensor of claim 13 wherein each of the first capacitor and the second capacitor extend entirely around the inner wall of the conduit.

21-33.(Canceled)

34.(New) The pressure sensor of claim 1 wherein the electrical insulator comprises glass.

35.(New) The pressure sensor of claim 1 wherein the electrical insulator comprises ceramic.

36.(New) The differential pressure sensor of claim 13 wherein the first electrical insulator and the second electrical insulator comprises glass.

37.(New) The differential pressure sensor of claim 13 wherein the first electrical insulator and the second electrical insulator comprises ceramic.

38. (New) The pressure sensor of claim 1 wherein the diaphragm is sealed to the vessel by a weld.

39. (New) The differential pressure sensor of claim 15 wherein the diaphragm is sealed to the conduit by a weld.